

CERTIFICATE

(1) Type Examination

(2) **Product intended for use in potentially explosive atmospheres - Directive 2014/34/EU**

(3) Type Examination Certificate Number: **DEKRA 18ATEX0024 X** Issue Number: **1**

(4) Product: **Temperature Sensors Series LEX45 and LEX55**

(5) Manufacturer: **Thermo-Electra Temperature Sensor Solutions**

(6) Address: **Weteringweg 10, 2641 KM Pijnacker, The Netherlands**

(7) This product and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

(8) DEKRA Certification B.V., certifies that this product has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products intended for use in potentially explosive atmospheres given in Annex II to Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014.

The examination and test results are recorded in confidential test report no. NL/DEK/ExTR16.0091/01.

(9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN 60079-0 : 2012 + A11 : 2013
EN 60079-7 : 2015

EN 60079-15 : 2010

(10) If the sign "X" is placed after the certificate number, it indicates that the product is subject to the Specific Conditions of Use specified in the schedule to this certificate.

(11) This Type Examination Certificate relates only to the design and construction of the specified product and not to the manufacturing process and its monitoring.

(12) The marking of the product shall include the following:



II 3 G
II 3 G

Ex nA IIC T6...T1 Gc (LEX45)
Ex ec IIC T6...T1 Gc (LEX55)

Date of certification: 30 July 2021

DEKRA Certification B.V.

T. Pijpker
Certification Manager

Page 1/6
Rev. 1

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(13) **SCHEDULE**

(14) **to Type Examination Certificate DEKRA 18ATEX0024 X**

Issue No. 1

(15) **Description**

Temperature Sensors Series LEX45 (Ex nA) and LEX55 (Ex ec), consist of a wide range of sensor types and sensor arrangements.

Each temperature sensor assembly is identified by a unique article number which is shown on the marking label.

For further details per LEX Series see the chapters below.

LEX45 (Ex nA)

General description:

Temperature Sensors Series LEX45 consist of a wide range of sensor types and sensor arrangements, inserts, threaded insert entries, termination options, connection head options, a direct cable connection option, cable sensor options, flying lead wire options and a ceramic insert option.

Sensors / inserts / cables:

The sensor is enclosed by a closed-end metallic tube or a mineral insulated metal sheathed cable, available in various diameters and length. The sensor insert can be a single or multiple thermocouple, PTC or NTC such as KTY, or resistance sensor (RTD).

Metallic inserts can have a measuring tip with various shapes, for example flat, round, etc. however always closed by welding. Internal wiring depends on the sensor type: 2, 3, 4, 6 or 8 wires per sensor.

Sensors may have optional mounting accessories such as a thermowell, a rigid or flexible protection tube and similar add-ons not affecting the type of protection.

Connection head / Junction box:

Only separately certified enclosures are used. The connection head / junction box may be provided with terminals or with a certified transmitter, with or without a display.

Connectors:

Ex nA compliant connectors may be used.

Electrical data:

Sensor circuit: max. 10 Vdc, 10 mA.

Transmitter: the electrical data specified for the transmitter shall be applied and complied with. The maximum input power to the transmitter shall not exceed 2,25 W.

Thermal data:

The ambient temperature range of the assembly, the service temperature range of the connection head / junction box, the transition parts and the cables depend on the material of the cable insulation as listed in the table below. This table is to be used as basis for evaluation of the complete assembly, as each situation has to be analysed with regards to the actual temperature range that each component will be subjected to in the particular application.

(13) **SCHEDULE**

(14) **to Type Examination Certificate DEKRA 18ATEX0024 X**

Issue No. 1

Cable insulation	Service temperature range of the cables	Allowed temperature of end seals, transition pieces and entry gland	Maximum service temperature range of connection head / junction box
PVC*	-25 °C / +105 °C	-40 °C / +105 °C	-50 °C / +200 °C**
Silicon*	-25 °C / +160 °C	-40 °C / +230 °C	-50 °C / +200 °C**
PTFE*	-45 °C / +200 °C	-45 °C / +230 °C	-50 °C / +200 °C**

* Cables can have other insulation such as Kapton and/or additionally a glass fibre and / or metallic braiding / sheathing which will alter the allowable temperature range.

** In case a transmitter is applied, the maximum service temperature shall be at least 10 K lower than the maximum allowed ambient temperature of the transmitter. The minimum service temperature may be limited by the minimum ambient temperature of the transmitter. Connection heads / junction boxes can have another service temperature range, depending on the material used for the sealing, etc. The minimum can be as low as -50 °C, the maximum temperature as high as 200 °C.

Maximum ambient temperature range is -45 °C to +80 °C; this can be limited depending on the materials applied (e.g. cables, connection head, junction box) or in case a temperature transmitter is applied.

The relation between the process temperature and the temperature class or maximum service temperature is as follows:

Maximum process temperature T_p (°C)	Temperature class / maximum service temperature (°C) of the assembly
75	T6
90	T5
125	T4
190	T3
285	T2
435	T1
> 435	$T_p + 10$

(13) **SCHEDULE**

(14) **to Type Examination Certificate DEKRA 18ATEX0024 X**

Issue No. 1

Series LEX 55 (Ex ec)

General description:

Temperature Sensors Series LEX55 consist of a wide range of sensor types and sensor arrangements, inserts, threaded insert entries, termination options, connection head options, a direct cable connection option, cable sensor options, flying lead wire options and a ceramic insert option.

Sensors / inserts / cables:

The sensor is enclosed by a closed-end metallic tube or a mineral insulated metal sheathed cable available in various diameters and length. The sensor insert can be a single or multiple thermocouple, PTC or NTC such as KTY, or resistance sensor (RTD).

Metallic inserts can have a measuring tip with various shapes, for example flat, round etc. however always closed by welding. Internal wiring depends on the sensor type: 2, 3, 4, 6 or 8 wires per sensor.

Sensors may have optional mounting accessoires such as a thermowell, a rigid or flexible protection tube and similar add-ons not affecting the type of protection.

Connection head / junction box:

Only separately certified enclosures are used. The connection head / junction box may be provided with terminals or may have flying leads.

Electrical data:

Sensor circuit, per sensor element: max. 30 Vdc, 10 mA

The sensor circuit may be connected to an (industrial) transmitter in the non-hazardous area.

Thermal data:

The ambient temperature range of the assembly, the service temperature range of the connection head / junction box, the transition parts and the cables depend on the material of the cable insulation as listed in the table below. This table is to be used as basis for evaluation of the complete assembly, as each situation has to be analysed with regards to the actual temperature range that each component will be subjected to in the particular application.

Cable insulation	Service temperature range of the cables	Allowed temperature of end seals, transition pieces and entry gland	Service temperature range of connection head / junction box (typical) **
PVC*	-25 °C / +105 °C	-40 °C / +105 °C	-40 °C / +200 °C
Silicon*	-25 °C / +160 °C	-40 °C / +230 °C	-40 °C / +200 °C
PTFE*	-45 °C / +200 °C	-45 °C / +230 °C	-45 °C / +200 °C

* Cables can have other insulation such as Kapton and/or additionally a glass fibre and / or metallic braiding / sheathing which will alter the allowable temperature range.

** Connection heads / junction boxes can have another service temperature range, depending on the material used for the sealing, etc. The minimum can be as low as -50 °C, the maximum temperature as high as 200 °C.

(13) **SCHEDULE**

(14) **to Type Examination Certificate DEKRA 18ATEX0024 X**

Issue No. 1

Maximum ambient temperature range is $-45\text{ }^{\circ}\text{C}$ to $+80\text{ }^{\circ}\text{C}$; this can be limited depending on the materials applied (e.g. cables, connection head, junction box).

The relation between the process temperature and the temperature class or maximum service temperature is as follows:

Maximum process temperature T_p ($^{\circ}\text{C}$)	Temperature class / maximum service temperature ($^{\circ}\text{C}$) of the assembly
75	T6
90	T5
125	T4
190	T3
285	T2
435	T1
> 435	$T_p + 10$

Installation instructions

The instructions provided with the product shall be followed in detail to assure safe operation.

(16) **Report Number**

No. NL/DEK/ExTR16.0091/01

(17) **Specific conditions of use**

In case that the actual application requires a detailed assessment regarding the service temperatures of the assembly (e.g. due to high process temperature combined with thermal insulation), a temperature measurement shall be conducted to verify that none of the specified temperature limits of the assembly is exceeded.

The sensor assembly with connection head and extension part, in case not IP54 sealed or closed, shall have a degree of protection of at least IP54, provided by the user with a thermowell or equivalent component at the process side of the assembly.

In case the nominal tip diameter of the mineral insulated metal sheathed sensor cable is less than 3 mm, the sensor must be considered as connected to ground. It must be assumed that it will not be able to pass the 500 Vac or 700 Vdc dielectric strength test as required by EN 60079-14. In addition, the sensor must be protected against mechanical impacts.

(18) **Essential Health and Safety Requirements**

Covered by the standards listed at item (9).

(19) **Test documentation**

As listed in Report No. NL/DEK/ExTR16.0091/01.

(13) **SCHEDULE**

(14) **to Type Examination Certificate DEKRA 18ATEX0024 X**

Issue No. 1

(20) **Certificate history**

Issue 0 -	project no. 218794800	initial certificate
Issue 1 -	project no. 225616300	extension of scope with LEX55